

What is claimed is:

1. An arrayed waveguide grating type optical multiplexer/demultiplexer comprising:

one or more optical input waveguides arranged side by side;

a first slab waveguide connected to the output ends of said optical input waveguides;

an arrayed waveguide consisting of a plurality of channel waveguides arranged side by side each having a length different from each other by a predetermined length and connected to the output end of said first slab waveguide;

a second slab waveguide connected to the output end of said arrayed waveguide; and

a plurality of optical output waveguides arranged side by side connected to the output end of said second slab waveguide,

said arrayed waveguide grating type optical multiplexer/demultiplexer having:

an optical demultiplex function to demultiplex a light having a plurality of wavelengths different from each other by a predetermined design wavelength spacing into a plurality of lights each having a wavelength different from each other; and

an optical multiplex function to multiplex a plurality of lights each having a wavelength different from each other

by a predetermined design wavelength spacing,

in case of optical demultiplexing, a light having a plurality of wavelengths different from each other by approximately an integral multiple spacing of said design wavelength spacing is inputted into said optical input waveguide of the arrayed waveguide grating type optical multiplexer/demultiplexer and demultiplexed into a plurality of lights each having a wavelength different from each other to be outputted from the said optical output waveguides,

in case of optical multiplexing, lights each having a wavelength different from each other by approximately an integral multiple spacing of said design wavelength spacing is inputted into each optical output waveguide of said arrayed waveguide grating type optical multiplexer/demultiplexer and each light of respective wavelength is multiplexed to be outputted from one of the optical input waveguides,

wherein an approximately rectangular optical amplitude distribution forming waveguide is connected between at least either one of one or more optical input waveguides and one or more optical output waveguides and the slab waveguide as the connection couple, and

said approximately rectangular optical amplitude distribution forming waveguide changes the optical amplitude distribution of the light propagating, from the optical input waveguide or the optical output waveguide toward the

corresponding slab waveguide side, from a Gaussian shape into an approximately rectangular shape.

2. The arrayed waveguide grating type optical multiplexer/demultiplexer according to claim 1, wherein said approximately rectangular optical amplitude distribution forming waveguide is formed by means of a trapezoidal waveguide having a width larger than that of the optical input waveguide or the optical output waveguide to be connected and enlarging its width increasingly toward the corresponding slab waveguide side.

3. The arrayed waveguide grating type optical multiplexer/demultiplexer according to claim 1, wherein:

said approximately rectangular optical amplitude distribution forming waveguide is a trapezoidal waveguide having a width larger than that of the optical input waveguide or the optical output waveguide to be connected and enlarging its width increasingly toward the corresponding slab waveguide side; and

at the narrower end of said trapezoidal waveguide is formed a straight waveguide of equal width part having the same width as said narrower end.

4. The arrayed waveguide grating type optical multiplexer/demultiplexer according to claim 1, wherein between the approximately rectangular optical amplitude distribution forming waveguide and the optical input waveguide

or the optical output waveguide to be connected respectively, is provided a narrow straight waveguide having a width narrower than that of said optical input waveguide and said optical output waveguide.

5. The arrayed waveguide grating type optical multiplexer/demultiplexer according to claim 2, wherein between the approximately rectangular optical amplitude distribution forming waveguide and the optical input waveguide or the optical output waveguide to be connected respectively, is provided a narrow straight waveguide having a width narrower than that of said optical input waveguide and said optical output waveguide.

6. The arrayed waveguide grating type optical multiplexer/demultiplexer according to claim 3, wherein between the approximately rectangular optical amplitude distribution forming waveguide and the optical input waveguide or the optical output waveguide to be connected respectively, is provided a narrow straight waveguide having a width narrower than that of said optical input waveguide and said optical output waveguide.